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**(54) Luer-lock fitting for medical infusion/transfusion lines**

Luer-Lock-Verschlussstück für medizinische Infusions- oder Transfusionsleitungen

Pièce de fermeture pour lignes médicales de perfusion/transfusion

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(56) References cited:  
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US-A- 4 624 664

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**EP 0 736 306 B1**

## Description

The present invention is related to Luer-Lock fittings for medical infusion/transfusion lines, of the type comprising a tubular body having at one end a Luer cone connector coaxially surrounded by a substantially cup-like innerly threaded attachment element, and a detachable cap sealingly connected axially over said Luer cone connector.

A Luer-Lock fitting of the above-referenced type is known from US-A-4,991,629.

In the Luer Lock fittings of the above referenced type a problem arises in connection with sterilizing the Luer cone connector, namely the outer surface thereof, and with preserving sterilization until the time of use of the fitting. Usually sterilization is performed by introducing a sterilizing gas, for instance ethylene oxide, within the fitting, in such a way that it efficiently leaps also on the outer surface of the Luer cone connector. The cap enables protection of the thus sterilized Luer-cone connector against risks of contamination until the time of use, i.e. when the cap is removed.

The object of the present invention is to provide a Luer-Lock fitting of the type set forth in the above, which allows the sterilizing operation to be carried out in a more convenient and efficient way, enabling the treatment gas to flow over almost the entire outer operative surface of the Luer cone connector, with a simple, functional and cheap construction.

According to the invention, this object is achieved by virtue of the fact that said cap is formed by a tubular element fitted between said outer Luer cone connector and said attachment element and having an outer end projecting beyond said Luer cone connector and carrying innerly a transverse filtering barrier, and an inner end forcedly coupled onto the outer surface of said Luer cone connector in proximity of the bottom of said attachment element so as to define, along a substantial portion of said outer surface of the Luer cone connector, an annular interspace, opening towards said filtering barrier.

According to a first embodiment of the invention, said inner end of the cap is formed with an inner annular enlarged portion for the forced coupling onto the outer surface of the Luer cone connector.

According to a variant of the invention, said outer surface of the Luer cone connector is formed with an outer annular enlarged portion for the forced coupling into the inner end of the cap.

The invention will now be disclosed in detail with reference to the accompanying drawings, purely provided by way of non-limiting example, in which:

- Figure 1 is a diagrammatic axially sectioned view of a Luer-Lock fitting for medical infusion/transfusion lines according to a first embodiment of the invention, and
- Figure 2 shows an alternative embodiment of figure

1.

Referring initially to figure 1, reference numeral 1 generally designates a Luer-Lock fitting for medical infusion/transfusion lines, comprising a unitary body of moulded plastic material 2 defining at one end a first outer Luer cone connector 3, intended to be coupled within the terminal end of a flexible hose, not shown in the drawings, and defining at the other end a second outer Luer cone connector 4.

Reference numeral 5 designates a substantially cup-shaped innerly threaded attachment element, formed integrally with the body 2 and coaxially surrounding a major portion of the outer Luer cone connector 4. The bottom wall of the cup-like attachment element 5, designated as 6, is joined to the Luer cone connector 3 through a number of axial grasp wings 7.

Reference numeral 8 indicates a protection cap sealingly fitted axially over the Luer cone connector 4. The cap 8, which is also made of moulded plastic material, is formed by a tubular member fitted between the Luer cone connector 4 and the attachment element 5 and having an outer enlarged end 9 projecting outwardly beyond the connector 4 and innerly carrying a transverse filtering barrier 10. The inner end of the tubular cap 8, designated as 11, has an inner annular enlarged portion 12 which is forcedly engaged in correspondence of the root portion of the Luer cone connector 4, i.e. in immediate proximity of the bottom wall 6 of the attachment element 5.

But for the annular enlarged portion 12, the cap 8 has an inner transverse section which is slightly larger than the outer transverse section of the Luer cone connector 4, whereby between the inner surface of the former and the outer surface of the latter an annular interspace 13 is defined, which opens towards the filtering barrier 10. This annular interspace 13 allows efficient sterilization practically of the entire operative outer surface of the Luer cone connector 4, by means of a sterilizing gas supplied within the Luer-Lock fitting 1 through the connector 3.

The variant shown in figure 2 is generally similar to the embodiment disclosed in the above, and only the differences will be described in detail, using the same numeral references for identical or similar parts.

Further to a different configuration of the Luer cone connector 3 and of the threaded cup-like element 5, which in this embodiment is constituted by a distinct member rotatably coupled on the body 2, this variant differs from the previously disclosed embodiment in that the forced coupling between the inner end 11 of the tubular cap 8 and the corresponding end of the Luer cone connector 4 is carried out by means of an outer annular enlarged portion 14 of the latter. Also in this case between the inner wall of the cap 8 and the outer surface of the Luer cone connector 4 an annular interspace 13 is defined, which is open towards the filtering barrier 10 so as to allow efficient sterilization of the

operative outer surface of the connector 4.

Naturally the details of construction and the embodiments may be widely varied with respect to what has been disclosed and illustrated, without thereby departing from the scope of the present invention such as defined in the appended claims.

#### Claims

Claims for the following Contracting States : ES, FR, GB, IE

1. Luer-Lock fitting (1) for medical infusion/transfusion lines, comprising a tubular body (2) having at one end an outer Luer cone connector (4) coaxially surrounded by a substantially cup-like innerly threaded attachment element, and a detachable cap (8) sealingly connected axially over said Luer cone connector (4), characterised in that said cap (8) is formed by a tubular element fitted between said Luer cone connector (4) and said attachment element (5) and having an outer end (9) projecting beyond said Luer cone connector (4) and innerly carrying a transverse filtering barrier (10), and an inner end (11) forcedly coupled onto the outer surface of said Luer cone connector (4) in proximity of the bottom (6) of said attachment element (5) so as to define, along a substantial portion of said outer surface of the Luer cone connector (4), an annular interspace (13), opening towards said filtering barrier (10).
2. Luer-Lock fitting according to claim 1, characterised in that said inner end (11) of the cap (8) has an inner annular enlarged portion (12) for the forced coupling onto the outer surface of the Luer cone connector (4).
3. Luer-Lock fitting according to claim 1, characterised in that said outer surface of the Luer cone connector (4) has an outer annular enlarged portion (14) for the forced coupling into the inner end (11) of the cap (8).

Claim for the following Contracting State : DE

1. Luer-Lock fitting (1) for medical infusion/transfusion lines, comprising a tubular body (2) having at one end an outer Luer cone connector (4) coaxially surrounded by a substantially cup-like innerly threaded attachment element, and a detachable cap (8) sealingly connected axially over said Luer cone connector (4), characterised in that said cap (8) is formed by a tubular element fitted between said Luer cone connector (4) and said attachment element (5) and having an outer end (9) projecting beyond said Luer cone connector (4) and innerly carrying a transverse filtering barrier (10), and an inner end (11) forcedly coupled onto the outer surface of said Luer

cone connector (4) in proximity of the bottom (6) of said attachment element (5) so as to define, along a substantial portion of said outer surface of the Luer cone connector (4), an annular interspace (13), opening towards said filtering barrier (10), and further characterised in that said outer surface of the Luer cone connector (4) has an outer annular enlarged portion (14) for the forced coupling into the inner end (11) of the cap (8).

#### Patentansprüche

Patentansprüche für folgende Vertragsstaaten : ES, FR, GB, IE

1. Luer-Lock-Verschlussstück (1) für medizinische Infusions/Transfusionsleitungen, mit einem rohrförmigen Körper (2), an dessen einem Ende ein äußerer Luer-Konusverbinder (4) vorgesehen ist, der von einem im Wesentlichen becherförmigen Innengewinde-Befestigungselement koaxial umgeben ist, und mit einer abnehmbaren Kappe (8), die axial über dem Luer-Konusverbinder (4) dichtend gehalten ist, dadurch gekennzeichnet, dass die Kappe (8) von einem Rohrelement gebildet ist, das zwischen dem Luer-Konusverbinder (4) und dem Befestigungselement (5) eingepasst ist und das ein äußeres Ende (9), das über den Luer-Konusverbinder (4) vorsteht und innen eine querverlaufende Filterschicht (10) trägt, und ein inneres Ende (11) aufweist, das auf der Außenfläche des Luer-Konusverbinders (4) in der Nähe des Bodens (6) des Befestigungselementes (5) zwangsgekoppelt ist und so längs eines wesentlichen Bereichs der Außenfläche des Luer-Konusverbinders (4) einen ringförmigen Zwischenraum (13), der sich zur Filterschicht (10) hin öffnet, bildet.
2. Luer-Lock-Verschlussstück nach Anspruch 1, dadurch gekennzeichnet, dass das innere Ende (11) der Kappe (8) einen inneren ringförmigen erweiterten Bereich (12) für die Zwangskopplung auf der Außenfläche des Luer-Konusverbinders (4) aufweist.
3. Luer-Lock-Verschlussstück nach Anspruch 1, dadurch gekennzeichnet, dass die Außenfläche des Luer-Konusverbinders (4) einen äußeren ringförmigen erweiterten Bereich (14) für die Zwangskopplung in das innere Ende (11) der Kappe (8) besitzt.

Patentanspruch für folgenden Vertragsstaat : DE

1. Luer-Lock-Verschlussstück (1) für medizinische Infusions/Transfusionsleitungen, mit einem rohrförmigen Körper (2), an dessen einem Ende ein äußerer Luer-Konusverbinder (4) vorgesehen ist, der

von einem im Wesentlichen becherförmigen Innengewinde-Befestigungselement koaxial umgeben ist, und mit einer abnehmbaren Kappe (8), die axial über dem Luer-Konusverbinder (4) dichtend gehalten ist, dadurch gekennzeichnet, dass die Kappe (8) von einem Rohrelement gebildet ist, das zwischen dem Luer-Konusverbinder (4) und dem Befestigungselement (5) eingepasst ist und das ein äußeres Ende (9), das über den Luer-Konusverbinder (4) vorsteht und innen eine querverlaufende Filterschicht (10) trägt, und ein inneres Ende (11) aufweist, das auf der Außenfläche des Luer-Konusverbinders (4) in der Nähe des Bodens (6) des Befestigungselementes (5) zwangsgekoppelt ist und so längs eines wesentlichen Bereichs der Außenfläche des Luer-Konusverbinders (4) einen ringförmigen Zwischenraum (13), der sich zur Filterschicht (10) hin öffnet, bildet, und ferner dadurch gekennzeichnet, dass die Außenfläche des Luer-Konusverbinders (4) einen äußeren ringförmigen erweiterten Bereich (14) für die Zwangskopplung in das innere Ende (11) der Kappe (8) besitzt.

#### Revendications

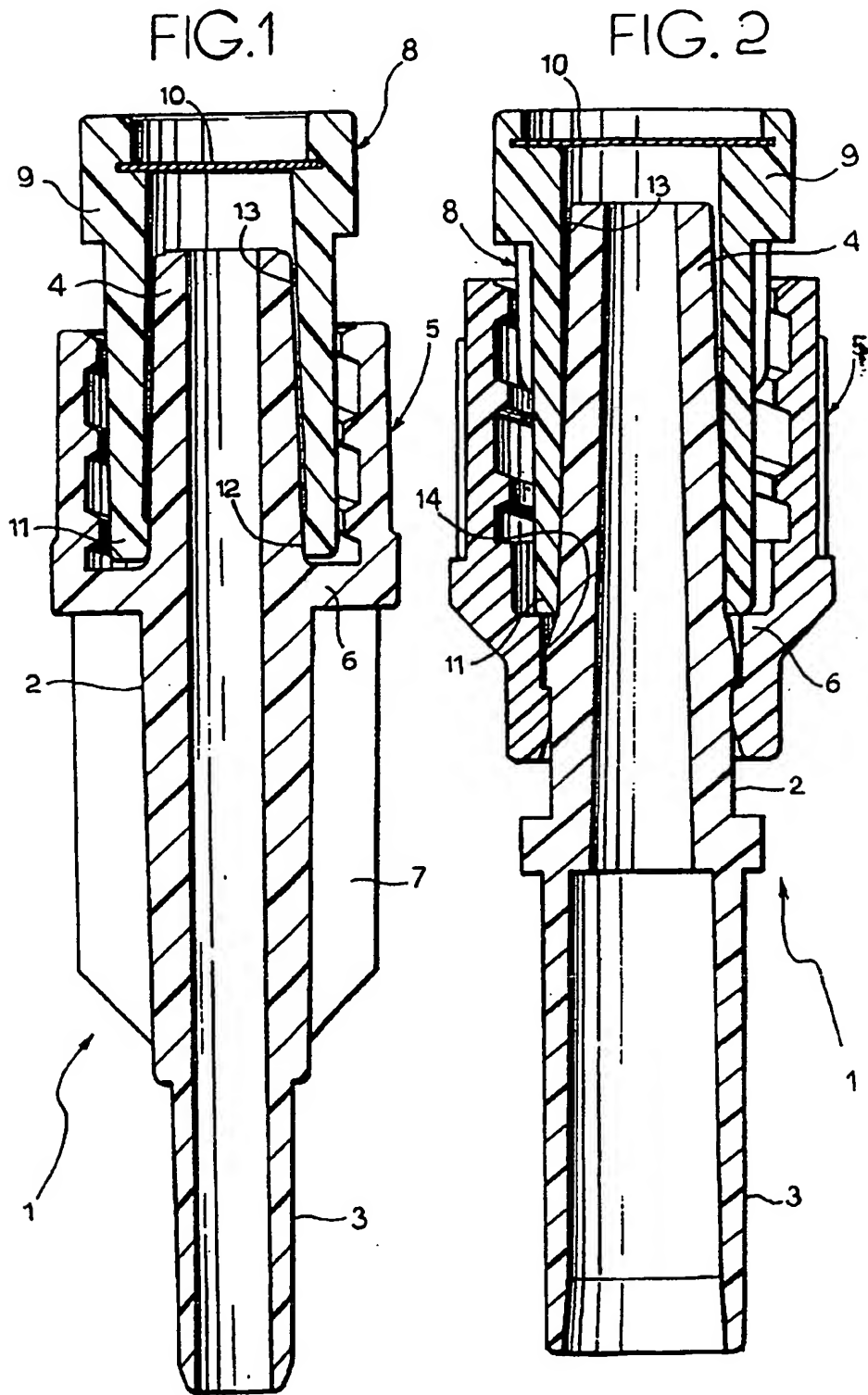
Revendications pour les Etats contractants suivants : ES, FR, GB, IE

1. Raccord Luer-Lock (1) pour tubes médicaux de perfusion/transfusion, comprenant un corps tubulaire (2) ayant à une extrémité un connecteur conique Luer extérieur (4) entouré coaxialement par un élément de fixation fileté intérieurement, sensiblement en forme de gobelet, et un bouchon détachable (8) fixé axialement de manière étanche sur ledit connecteur conique Luer (4), caractérisé en ce que ledit bouchon (8) est constitué par un élément tubulaire ajusté entre ledit connecteur conique Luer (4) et ledit élément de fixation (5) et comportant une extrémité extérieure (9) qui fait saillie au-delà dudit connecteur conique Luer (4) et qui porte intérieurement une barrière filtrante transversale (10), et une extrémité intérieure (11) couplée à force sur la surface extérieure dudit connecteur conique Luer (4) à proximité du bas (6) dudit élément de fixation (5) de manière à définir, le long d'une partie sensible de ladite surface extérieure du connecteur conique Luer (4), un interstice annulaire (13) qui débouche en direction de ladite barrière filtrante (10).
2. Raccord Luer-Lock selon la revendication 1, caractérisé en ce que ladite extrémité intérieure (11) du bouchon (8) comporte une partie annulaire intérieure agrandie (12) pour le couplage forcé sur la surface extérieure du connecteur conique Luer (4).
3. Raccord Luer-Lock selon la revendication 1, caractérisé en ce que ladite surface extérieure du con-

necteur conique Luer (4) comporte une partie annulaire extérieure agrandie (14) pour le couplage forcé dans l'extrémité intérieure (11) du bouchon (8).

#### Revendication pour l'Etat contractant suivant : DE

1. Raccord Luer-Lock (1) pour tubes médicaux de perfusion/transfusion, comprenant un corps tubulaire (2) ayant à une extrémité un connecteur conique Luer extérieur (4) entouré coaxialement par un élément de fixation fileté intérieurement, sensiblement en forme de gobelet, et un bouchon détachable (8) fixé axialement de manière étanche sur ledit connecteur conique Luer (4), caractérisé en ce que ledit bouchon (8) est constitué par un élément tubulaire ajusté entre ledit connecteur conique Luer (4) et ledit élément de fixation (5) et comportant une extrémité extérieure (9) qui fait saillie au-delà dudit connecteur conique Luer (4) et qui porte intérieurement une barrière filtrante transversale (10), et une extrémité intérieure (11) couplée à force sur la surface extérieure dudit connecteur conique Luer (4) à proximité du bas (6) dudit élément de fixation (5) de manière à définir, le long d'une partie sensible de ladite surface extérieure du connecteur conique Luer (4), un interstice annulaire (13) qui débouche en direction de ladite barrière filtrante (10), et caractérisé en outre en ce que ladite surface extérieure du connecteur conique Luer (4) comporte une partie annulaire extérieure agrandie (14) pour le couplage forcé dans l'extrémité intérieure (11) du bouchon (8).



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